Menlo Park Notebook #110 [N-80-08-00]

This notebook has no dated entries but was probably used in 1880. All of the entries are by Francis Upton, with the exception of one entry by Edison, and relate to calculations for a central station system. Most of the entries are block-by-block calculations of the copper needed for the Pearl Street district. There are also a series of notes and calculations relating to the economy of the central distribution system and to the cost of a system of 10,000 lamps as compared to the cost of gas. The label on the front cover is marked "Hammer" and "N.Y. Cen. Station." The book contains 284 numbered pages.

Blank pages not filmed: 1, 138-284.

1013 feet

127
27
889
14

If 1013 feet

127
33
381
321
4191

12 17 11 — Lumps
25
50
10 | 330
33

127
33
381
321
4191

Block 9

762 31

260
40

10 [illegible]
90

36.1
3 2
152 5.3 Hrs

Book 4

Lamps

762 - 1031 - 1340

37

301
37
1444
1083
1327.4

Block 5

21-

702 —

176
25
1765 Lumps
16.5-

72.2
16.5
3610
4332
722
1191.30 Lbs

31-

472 —

170
75
2 2 5 Lumps
22.5

27.6
22.5
138
1104
552
621.0 Lbs

Bank 6

Pt.
4 50

Lamps.
120
50
170
17

27.6
17
1932
276
4692 lbs

831

50
10150 lamps
8

66.1
8
528 lbs

Block 7.

Qr. Rampes.

4½ — 40
60

27.5 . 14/100 Ramp.
10

276.5 lbs

831 — 10/Ramp.
6

86.1
6

516.6 lbs

Block d.

11 Lamps
831 — 10/22.0
22

86.1
22
1722
1722
1894.2 lbs

Block 9

91 Lumps
801 — 10|95
7.5

86.1
7.5
4305
6027
645.75 lbs

91 Lumps
1665 — 10|310
31

14.4
31
40 4
42 2
435 2.4 lbs

186
31
186
558
5766

Book 10.

Ft- Lamps

1065 — 1230

23

140 · 14

23

7 2

2 8 2 5

3 2 2 9 2 - Ans.

186

23

558

372

4278

1013

127
125
635
254
127
15875

Block 11

1- Lamps

127 — 14 | 123-
12.5

2- Lamps

752 — 140
105
10 | 245
24.5

183
123-
615
366
22875

703
24.5
3515
2812
1406
17223.5 lbs

127
11
127
127
1397

Block 12

ft. Lamps

1207 — 10 | 120
2322 — 12
40
30
10 | 110
11

1397
11
2038 lbs.

ft. Lamps

479 — 10 | 140
14

28.8
14
1152
288
4032 lbs.

Block 13

Lamps

1207 — 10/20 = 2 — 183 × 2 = 366.60

752 — 10/20 = 2 — 72.2 × 2 = 144.4

479 — 10/28 = 28 — 26.- × 28 = 2204
576
796.4

Block 14

21		Lamps	72.2
760		10/10	72.2 lbs
		1	
396		12/40	20.0
		4	4
			80 lbs

Block 15

91-
762-

Lamps

10 | 240
24

72.2
4
288.8

396 —

10.0
40.
10 | 140
14

20.0
14
280.0
40

167 —

50
10.0
10 | 150
15

3.612
15
18060
3612
54180

Block 16.

71 - Lamps

167 - 40
10
30

15 | 80
5

30 1.2
80
288.9 lbs

472 - 16 | 30
3

27.6
3
82.8 lbs

Block 17.

31-220 — Lamajo 1490/9 — 6.050 × 9 = 5445.0 lbs

472 — 10/80/8 — 27.6 × 8 = 220.8 lbs

831 — 10/110/11 — 86.1 × 11 = 946.1 lbs

Block 18

Lamps

711

831

10/80

8

261

6

6 F 1.8

186
6.5
930
1116
1209.0

Block 19.

71. . Lamps.

1065 — 10/65
6.5

1046 — 10/75
7.5

1378
7.5
6890
19646
13785.0

140.4
6.5
20
24
1460

187
11
187
187
2057

Rivoli.

Lampo.

1865 — 10/110.

1378
11
1378
1378
2756

1046 — 10/110.

1378
11
1378
1378
2756

Reich 21.

Ramps.

396	10/55	5.5	20.0 × 5.5 = 110.00 lbs
479	10/50	5	28.8 × 5 = 144.0 lbs
167	10/65	6.5	3.612 × 6.5 = 18060 + 21672 = 23.478.0 lbs
167	10/75	7.5	

3.612 × 7.5 = 18060 + 25284 = 270900 lbs

Block 22.

8		Lamps
167		10/130
		15

3.612
15
18060
36120
54180 lbs

Block 23.

ft		Lamps
220	—	90
		60
		10 | 150
		15
364	—	10 | 70
		7

6.05
15
3025
605
90.75
10

16.2
7
113.4 lbs

Block 24.

Ft.		Lamps.	
1046.	—	10/90. 9	137.8 / 1240.2 lbs
634	—	10/70 7.	49.6 / 347.2 lbs
364	—	10/150 15	16.2 / 15 / 81.5 / 162 / 243.5 lbs

Block 25.

71-
1046 —
634 —

Lamps.
10/145-
14.5
2.25.
80
10/305-
305

135.2
14.5
6760
5408
1352
196 040
80

49.6
30.5-
2480
1488
15-12,80 lbs

Block 26

21 — Lamps — 6.05 / 10.5 — 3025 / 605 / 63.525 / 110

220 — 10 | 185 / 10.5 — 18.25 / 11 / 18.25 / 182.5 / 200.75 / 110

537 — 10 | 110 / 11

364 — 45 / 20 — 16.2 / 6.5 / 810 / 972 / 105.30

10 | 65 / 6.5

Block 27.

Lamps

16.2
8
129.6
lbs

91 — 30.
30
60
10 | 60
8

364, — 30.
30
60
10 | 60
8

634, — 10 | 80
8

49.6
8
396,8
lbs

337. — 10/50
5

11,25
5
91,25 lbs

Block 28.

31-	Lamps		49.6
634-	10260		2.6
	26		2976
			992
			12896
			lbs

Block 29.

21 — Lamps.
752 — 10/155.
15.5

7.13
15.5
35 1 5
3 5 1 5
7 0 3
10 8 7.6 5 lbs

Book 30.

91-	Lamps.		70.5
752	10/20		2
		1	50.246
1280	10/20		2648
		2	2
			409.6
			Lbs.
479	10/210		25.8
		21	21
			258
			516
			541.8
			Lbs.

Book 31.

At Lamps.

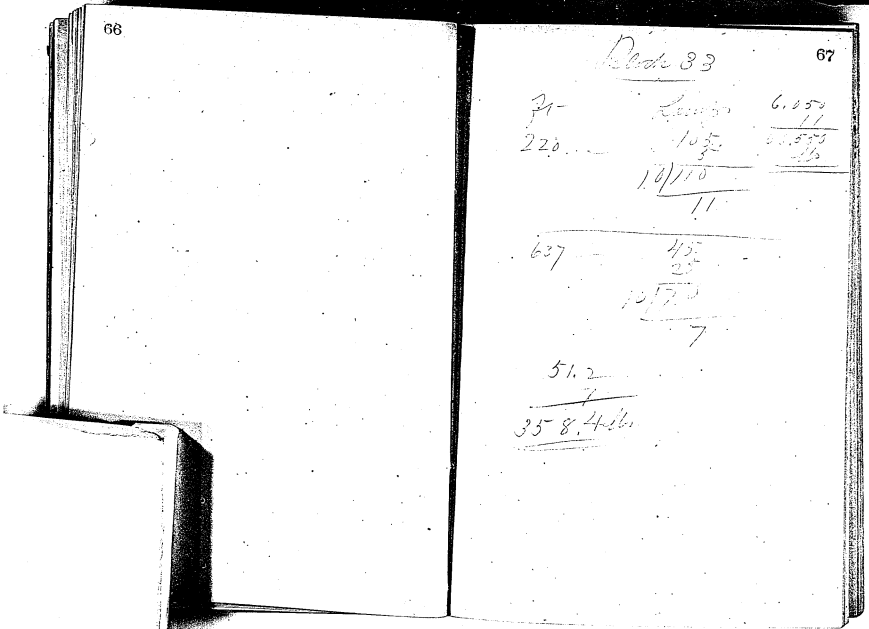
479 — 14/200 — 20 — 24.2 — 50 — 576.0

Block 32

167 — Lamps

1.806
16
10836
1806
28896 lbs

Book 33



Book 84.

71 —	Lumps		9.11.
537 —	10/90.	9	81.99
1057 —	10/	3	687.0

Weight 35

Jan — Lamps

1051 — 10 | 241.
24

137.8
24
5512
2756
3307.2 lbs

Block 96

91 Ramps

1280. = 10,483
18

204.8
18
1638 4
2048
3686,4 lbs

Book 37.

71
75 3 — 10/20 Lawn
2

70.3
2
140.6 lbs

128 10/16
1

204.6
7
1433.6 lbs

Book 38.

71-
753.

Lumber
12/12m
12

709
12
84 5.6

1260.

-105
12

204.8
4
19.2 lbs.

78

Block 39

79

21	Lumps	70.3	
253	10/60	421.8	
	0		
1250	70/10	2048	
	1		
		2048	

Block 40

Lengths

21 —

136 — 10/90

9

51,2

460,8 ft

Buch 41

fl-	Lauf.
636 —	19/1.50
	15

31.2
15
234.0
12
1680.00

Birch 42.

Jan — Tonnage 1324

1851 — 10 1/2 [illegible]

130 — [illegible]

1324

79 2..lbs

Buck #3

91 - 127.8
1035 - 91 / 9 = 10.2

1430 — 1/70 / 9

1595 / 9 = 355.0 lbs

Block 44

Block 45

21-
1280 —

Lumpkin
10170
7

2048
7
14336.00

92

93

Rock #6.

21- Kaiyo. 204.8

1250 — 10|30 — 6149

752 — 5|45 — 704.3

4.5 — 3171

1250 — 10|45 — 9116.25

4.5

204.8
45
1240
792
9216.00

Bloch 47.
21—
759 — 10/110
11

70.3
11
77 3.3 Ub.

Block 48.

2 — Lumber

636 —— 10 | 210

21

51.2

21

51.2

1024

1075.2 lbs.

Block 49

2+
636 Lamps
1024
20

512
20
10240.00

Block. 50.

74 Lamps.
1130 —— 14/15-0
15-

15-9, 5-
15-

79 7 5
15 9 5-
2372.5.11.6

Block 51.

21 Lambs
1130 — 11/170
14

1595
14
6380
1595
22330 lbs.

4352
3229
912
1575
10068

5766
4278
1209
2057
13310
10665
2642

Lbs
4941.
6039.
1985.
1227.4
1191.30
573.20
408.2
568.8
276.
516.6
187.2
545.75
5766
4278
2287.35
1722.95
2013.3
773.3
483.2
305.
114.4
445.4
35700

Lbs Centinewtons
105
722.2
881.
288.8
220.
54.18
288.96
82.8
54.45
220.8
946.1
688.8
1209.
1033.56
2057
1515.8
110.0
144.3
23.4780
27.09
54.18
20.75
11.9.7
8644.
35700
348

Ms continued.

1240,2
347,2
243,5
1960,40
1512,80
63,525
200,75
105,30
129,6
346,8
,91,25
128,76
1089,65
56,24
409,6
604,8
576,0
28,896
66,550
358,4
81,77
689,
3807,2
3686,4

17363,

Ok

24630.
17363.
8648.
35700

86341 Total

86341.
2642
88983

lbs. corrected

1103

140.6
1433.6
643.6
819.2
721.8
264.8
460.8
768.
689.
792.
1240.2
1435.5
4505.6
1433.6
614.4
916.35
921.6
773.3
1075.2
1024.5
2392.
2233.

28530

24630, corrected

144
84
60.

57.

84.-

16
9
144

L 50.

40 2400
240
0

84.

3

35.

4.

12.

84
15
420
54
60

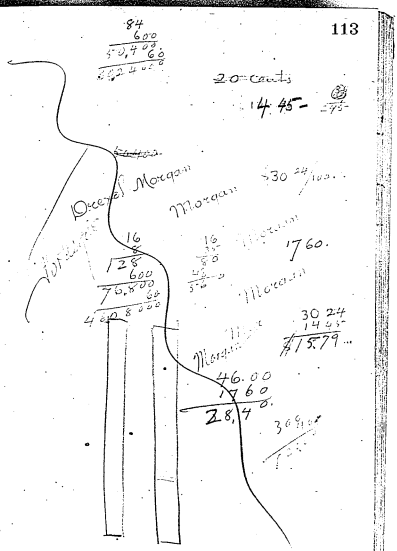
84
12.
168
84
00

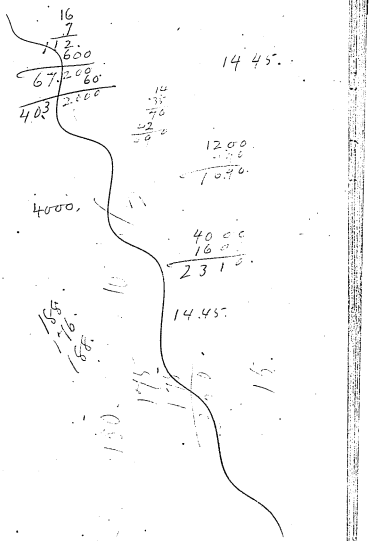
3200.

50c q per horse power

9 16.

600 lamps
7 per hp. 12 candles each.
300, 9 per hp. 16 candles " Lamp 35c


20 cents
14.45
Morgan
1760.
30 24
46.00
1760
28,14


16
7
12
600
67
200
60
2
100
40³
1445.
12
35
20
2
50
12000
1076.
4000,
40
16
231
14.45.
1565
+16
1581.

At present lamps are
made which will give
16 candles for 1/8 of
a horse power of energy
in the shape of current
of electricity.

That is 8 lamps may
be obtained ~~from~~ each of
giving 16 candles for one
horse power ~~in~~ 33,000
ft. lbs. per minute of
available electrical energy

That is. 8 lamps each
giving 16 candles if ex-
mensed in a dynamo
will show 33,000

ft. lbs per minute given to the water in heat.

The life of these lamps will average 600 hours. giving 16 candles, that is if 10000 lamps are lighted and a record kept of the hours that they have lighted the sum total of the burning time of all the lamps would be 6000000 hours

At 8 per hour power
of 16 candles the light
is calculated as burning
the entire day at per
hour. Cost per 365 hours
~~$1.50~~ $1.50
Cost lamps .35
$1.85

For 10,000 lamps
For power $15.000
For lamps 3.500
18,500

Received from them at
$1.50 per M

$45.000
18.500
Profit $26.500

8 | 124
16.

for a H.P. of current.

12 | 128
10.7

10 p.r. H.P. 12 candles each

10 p.r. H.P 12 candles each

1/4 X 8 = 2 cts per hour

2 cts per hour
600 hours

$12.00 for 10 lamps three hours
3.50 for 10 lamps cost.
$15.50

$155 per lamp cost
to company

At 9 per hour power
there come be obtained
from the same plant
for more lights

8 | 10000
1250

11,250 lights
.35 lamps

56250
33750
39375

Prescipts. 45750
7875
52350

15000
39750
$ 18.75

$ 52.35
18.75
$ 33.60
26.50
Increase profits $ 07.10

11 Camps for 1 Horse Power

11 Camps for

35
35
35

~~$ .02 cts~~
6.00
$ 12.00
3.85
11 | $ 15.85
$ 1.44

1.85
1.44
11 cts gain per Camp
1/2 5.5 cts (½ to be added to p.w.
1/5 2.2 cts

Company sells 10 Camps

Tests show that
10 lamps of 12 candles
each may be obtained
from each horse power
of electricity. That is
if such a lamp were,
when giving 12 candles,
immersed in a vessel
of water, the water would
rise in temperature at a
rate indicating that 3300
ft lbs of energy were added
to it every minute in heat.
Such a lamp will last
on a average 600 hours

That is, if 10000 lamps 129
were lighted at irregular
or regular intervals and
a careful record were
kept of the time that
each lamp was giving
12 candles of light, and
after every lamp had
ceased to give light the
various burning times were
summed up, it would
be found that they had
burned an aggregate
10000 X 600 = 6000000 hours

The lamps are considered as burning an equivalent to 12 candle gas, that is each one giving 12 candles may be thought as taking and consuming of five cubic feet of gas for each hour that they are burned.

This unit is taken as it is found by experience that the devices by which the light may be made so much more effectual & practically effectual & add so much to the apparent light that

every is satisfied when
he finds that it is giving
a good gas jet.
Also that gas cannot
be burnt in practice
so as to give out the
maximum of light
which the electric light
should give to
so much as does the
tester at the laboratory
of 12 Candles of electric light
will give a jet of 12 to 15
Candles of effective Light as
Compared with gas

$ 2.560 000

365
25
1825
730
9125

365
20
7300
7200
146 0000

57.1
5 2 5 5 5 000

5 2560
225
262800
105120
10512
118.260.000

15,150
37.725
30 000
6.700
46 800
3 000
75 000
5 000
$ 220.075
110
$ 230.075
36
20.5
1820
730
7 [illegible]

220.075) 76991.0 (349

660225

1096750

880300

2166500

330.42) 76990 (233

660

1090

990

100

220) 3757 (170

220

1555

1540

150

330) 3757 (114

330

457

330

1270